REMARKS/ARGUMENTS

Addressing Examiners remarks starting with ¶ 1, Claims 14 and 15 are withdrawn.

[2] Abstract is amended to comply with Examiner's request.

[3] Claim 13 is amended to comply with Examiner's request.

[5] As discussed in the telephone call of March 9, Dr. Harris, an inventor of U.S. 6,149,123 and the current application, explained that the performance of the flexible membrane, and thus the valve itself, with the addition of the second result was an "unexpected result". It was not clear whether or not the membrane would flex in a reliable manner with the addition of a second stiffening element. Had the membrane cracked or burst at a low pressure, the inventors would not have been surprised. However the fact that the membrane performed well and with not excessive experimentation was totally unexpected. Please note that this invention cures an operating problem associated with a narrow band of external conditions but which lead to catastrophic failure of the valve. This invention occurred about eight years after the first invention, involving two of the original inventors and two new inventors. The examiner is correct that the '123 invention is quite close to the current invention; the two devices are identical in every aspect except one, the second pedestal, which cures a very serious flaw which was not obvious for quite some time. The applicants tried many alternative methods, such as moving the location of the first pedestal, increasing the thickness of the flexible membrane to make it more stiff, increasing the amount of concavity of the membrane in the closed state; none of these alternatives reduced the catastrophic failure rate to a level acceptable in a commercial device.

[6] The instant invention and the '123 invention were both commonly owned at the time of the inventions and share two inventors.

[7] Applicant contends that Nestler is teaching a valve made of conventional steel and other metallic materials which exhibit a certain flexibility and ductility which a silicon valve does not have. Designing a MEMS device of single crystal silicon requires considerably more knowledge of silicon; very few of the teachings of designing with steel are applicable to designing with silicon.

[8] The Johnson invention pertains to shape memory alloy and the use of a phase transition temperature and electrostatic forces to achieve actuation. It is not apparent to applicants how to "consider the sensor is a second pedestal". The function, design and construction of a pedestal and a sensor are totally different; how one would extrapolate from a sensor on an actuator to a pedestal on a cantilever is not clear. The purpose of a pedestal on a cantilever is to maintain the flexible membrane in its concave position until the cantilever has started to open. A failure mechanism of the '123 invention is the flexible membrane expanding outward in regions apart from the first pedestal such that the cantilever does not open. Placing the second pedestal on the cantilever is an alternative and possibly lower cost embodiment of placing the second pedestal on the flexible membrane.

[9] Applicant has reviewed the prior art made of record and not relied on; applicants respectfully state that none of the prior art teaches the instant invention and the limitations as now stated in the amended claims.

Applicant has added additional restrictions to independent claims 1, 6 and 16; withdrawn claims 14 and 15; amended dependent claims 4, 5, 9, 10, 11 and 13; and amended the abstract.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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